UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/497,482	02/04/2000	Masahiro Suzuki	103689.01	7544

25944 7590 03/24/2005

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
HENN, TIMOTHY J	

ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/497,482	SUZUKI ET AL.	
	Examiner	Art Unit	
	Timothy J Henn	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 August 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/342,512.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-6 and 11-16 have been considered but are moot in view of the new ground(s) of rejection.

2. Applicant's arguments, see applicants response, filed 27 September 2004, with respect to the rejection(s)of claim(s) 7-10 under 35 USC §102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Sasaki (US 6,289,127) in view of Juenger et al. (US 5,778,106).

Inventorship

3. In view of the papers filed 27 September 2004, the inventorship in this nonprovisional application has been changed by the deletion of Yutaka TSUDA.

The application will be forwarded to the Office of Initial Patent Examination (OIPE) for issuance of a corrected filing receipt, and correction of Office records to reflect the inventorship as corrected.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyake (US 5,631,701) in view of Kijima et al. (US 6,661,451).

[claim 1]

Regarding claim 1, Miyake discloses a digital camera comprising: an image-capturing device (Figure 1, Item 108) that captures a subject image having passed through a taking lens (Figure 1, Item 102) and outputs image data; a memory device in which image data of at least one frame of an image captured by the image-capturing device is temporarily stored (Figure 1, Item 118; c. 3, l. 63 c. 4, l. 11); a recording processing circuit that performs recording processing on image data stored in the memory device (Figure 1, Item 122; c. 4, ll. 44-61) and a first image processing circuit that first performs pre-treatment on image data corresponding to N lines X M rows output by the image-capturing device to store image data of one frame in said memory device (Figure 1, Item 110; The examiner notes that the data output by the CCD inherently has a fixed resolution which can be defined as N lines X M rows) and a second image processing circuit that performs format processing appropriate for recording performed at the recording processing circuit on the image data having undergone said pre-treatment before the image data of one frame is stored in said memory device (Figure 1, Item 114; The examiner notes that the format processing (i.e. Y/C conversion) is performed prior to the storage of image data of one frame in the memory device, and that it is performed on image data having already undergone pre-treatment). It is further noted the Y/C conversion will occur on a minimum of 1 complete RGB pair (i.e. a n x m block where n = m = 1).

However, outputting image data in line sequence (e.g. progressive or raster scanning) is notoriously well known in the art. For example, Kijima discloses a method of reading image data from a CCD device in which pixel signals are read in a line-sequential manner (i.e. in units of lines in line sequence) in order to obtain fine image data (e.g. c. 3, ll. 51-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to read out image data in line sequence in the camera of Miyake as taught by Kijima to obtain a fine image. It is noted that the image data will be processed in the manner it is output by the first image processing circuit of Miyake (see Figure 1).

[claim 2]

Regarding claim 2, Miyake discloses a recording processing circuit which is constituted of a compression circuit that compresses image data (Figure 1, Item 122; c. 4, ll. 44-61).

[claims 4 and 5]

In regard to claims 4 and 5, note that these claims contain all limitations of claims 1 and 2 with the inclusion of a storage medium having a program stored therein to store a method which performs the steps taken by the apparatus in claims 1 and 2. Official Notice is taken that it is well known in the art to implement methods in software to take advantage of general purpose hardware which does not need to be specifically designed for a single application and allows for easy upgrading. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made

to implement a software version of the apparatus of claims 1 and 2 as claimed in claims 4 and 5.

6. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyake (US 5,631,701) in view of Kijima et al. (US 6,661,451) in view of Freeman (US 4,774,565).

[claim 3]

In regard to claim 3, note that Miyake discloses pre-treatment which includes gamma correction and white balancing (c. 3, ll. 50-62). However, Miyake in view of Kijima does not disclose format processing which includes interpolation processing, LPF and BPF filter processing and color difference signal calculation processing.

Freeman discloses an apparatus which uses filtering (Figure 1, Items 28-36; The office notes that Freeman uses only low-pass filtering, however low-pass filtering is just a subset of band-pass filtering (i.e. passing all signals from 0 to a threshold)), color difference signal calculation (Figure 1, Items 24, 26 and 40) and interpolation (Figure 1, Item 40) to reconstruct missing color samples for pixels without introduction of excessive color fringes (Column 1, Line 58 – Column 2, Line 25). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the system of Freeman for producing complete color signals for each pixel without introduction color fringes.

[claim 6]

In regard to claim 6, note that these claims contain all limitations of claim 3 with the inclusion of a storage medium having a program stored therein to store a method which performs the steps taken by the apparatus in claim 3. Official Notice is taken that it is well known in the art to implement methods in software to take advantage of general purpose hardware which does not need to be specifically designed for a single application and allows for easy upgrading. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a software version of the apparatus of claim 3 as claimed in claim 6.

7. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US 6,289,127) in view of Juenger et al. (US 5,778,106).

[claim 7]

Regarding claim 7, Sasaki discloses a digital camera comprising: an image-capturing device (Figure 7, Item 3) that captures a subject image having passed through a taking lens (Figure 7, Item 1) and outputs image data and a recording processing circuit that performs recording processing on image data (Figure 7, Item 9; c. 1, ll. 37-62). However, Sasaki does not disclose an image processing circuit that, with the image data output by the image capturing device as data corresponding to n lines X m rows, calculates a color difference signal based upon the image data thus input, performs interpolation processing a low pass filtering processing simultaneously on said color difference signal using filter coefficients for interpolation/low pass filtering and then

performs matrix processing appropriate for recording performed at said recording processing circuit to generate a formatted signal.

Juenger teaches an interpolation system wherein RGB are linearly interpolated, the interpolated RGB signals are converted into color difference signals (e.g. R-G, B-G), median filtering processing is performed on the color difference signals in order to reduce color fringe artifacts and the processed color difference signals are converted back into RGB signals (c. 6, ll. 33 - c. 8, l. 13). The examiner notes that the median filtering processing of Juenger includes both interpolation (i.e. obtaining new signal values from a set of known values) and low pass filtering (i.e. removing high frequency signal components) characteristics and therefore can read on the simultaneous "interpolation/low pass filtering" claimed. It is further noted that the processing of Juenger inputs values from nine pixels and replaces the pixel value at the center of the filter region with the median value of all the pixels within the region, therefore it can be said that each pixel in the region has a "filter coefficient" of 1. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the processing of Juenger in the camera of Sasaki to remove color fringe artifacts. However, Sasaki in view of Juenger does not explicitly disclose performing matrix processing appropriate for recording on the processed color difference signals.

Sasaki teaches compressing the taken image using a JPEG encoding scheme (c. 1, ll. 37-62). Official Notice is taken that one is able to obtain higher compression with JPEG when using luminance/chrominance color spaces such as YUV or YCrCb. Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to convert the processed RGB signals of Sasaki in view of Juenger into luminance/chrominance color space (i.e. matrix processing) in order to maximize the amount of compression obtained from the JPEG encoding scheme used.

[claim 8]

Regarding claim 8, Sasaki discloses a recording processing circuit which is constituted of a compression circuit that compresses image data (Figure 1, Item 9; c. 1, ll. 37-62).

[claims 9 and 10]

In regard to claims 9-10, note that these claims contain all limitations of claims 7-8 with the inclusion of a storage medium having a program stored therein to store a method which performs the steps taken by the apparatus in claims 7-8. Official Notice is taken that it is well known in the art to implement methods in software to take advantage of general purpose hardware which does not need to be specifically designed for a single application and allows for easy upgrading. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a software version of the apparatus of claims 7-8 as claimed in claims 9-10.

8. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Freeman (US 4,774,565) in view of Nagasaki et al. (US 5,153,730).

[claim 11]

Regarding claim 11, AAPA discloses a digital camera comprising: an image capturing device that captures a subject image having passed through a taking lens and outputs image data (Page 2); a first image processing circuit that first performs pre-treatment on image data corresponding to N lines X M rows output by the image-capturing device in units of individual lines in line sequence (Pages 2 and 3); a second image processing circuit that performs image processing including data format processing appropriate for data compression on the image data output (Pages 2 and 3); and a compression circuit that compresses the image data output by the second image processing circuit (Pages 2 and 3). Therefore it can be seen that AAPA lacks performing median processing on image data corresponding to an n X m pixel area block during format processing.

Freeman discloses performing median processing on color difference signals in order to reduce color fringe artifacts (c. 1, l. 58 - c. 2, l. 25). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform median filtering in order to reduce color fringe artifacts. AAPA discloses format processing to convert image data into 8x8 sets of color difference data (Pages 2 and 3). If the median processing is applied to the entire image as taught by Freeman, the median processing would naturally "correspond to an n X m pixel area block during said format processing" as claimed. However, AAPA in view of Freeman lacks a memory device in which at least one frame of image captured by said image-capturing device is temporarily stored, storing the image data after pre-treatment in the memory device and

reading out the pretreated data to be further processed by the second image processing circuit.

Nagasaki discloses storing frames of image data having undergone pre-treatment (e.g. amplification and A/D conversion) in a memory card (Figure 1, Item 34) and performing data formatting and compression (c. 8, ll. 46-55; c. 10, ll. 14-26) during non-operating periods of the camera in order record high quality images while enabling the user to take many pictures at short intervals (c. 2, ll. 17-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the data format processing and compression of AAPA in view of Freeman during non-operating periods of the camera in order record high quality images while enabling the user to take many pictures at short intervals.

[claim 12]

Regarding claim 12, note that the median processing of freeman is performed on (n-i) X (m-j) sets of image data extracted from image data corresponding to a n x m pixel area (c. 4, ll. 20-41; c. 5, ll. 43-51; While AAPA discloses generating 8x8 blocks of color difference data, Freeman discloses the use of a 1x7 area for median data which clearly fulfils the (n-i) X (m-j) requirement).

[claim 13]

Regarding claim 13, AAPA discloses a digital camera comprising: an image capturing device that captures a subject image having passed through a taking lens and outputs image data (Page 2) and a first image processing circuit that first performs pre-treatment on image data corresponding to N lines X M rows output by the image-

capturing device in units of individual lines in line sequence (Pages 2 and 3). Therefore it can be seen that AAPA lacks a second image processing circuit performing median processing on image data corresponding to an n X m pixel area block during format processing.

Freeman discloses performing median processing on color difference signals in order to reduce color fringe artifacts (c. 1, l. 58 - c. 2, l. 25). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform median filtering in order to reduce color fringe artifacts. AAPA discloses format processing to convert image data into 8x8 sets of color difference data (Pages 2 and 3). If the median processing is applied to the entire image as taught by Freeman, the median processing would naturally "correspond to an n X m pixel area block during said format processing" as claimed. It is further noted that the median processing of freeman is performed on (n-i) X (m-j) sets of image data extracted from image data corresponding to a n x m pixel area (c. 4, ll. 20-41; c. 5, ll. 43-51; While AAPA discloses generating 8x8 blocks of color difference data; Freeman discloses the use of a 1x7 area for median data which clearly fulfils the (n-i) X (m-j) requirement). However, AAPA in view of Freeman lacks a memory device in which at least one frame of image captured by said image-capturing device is temporarily stored, storing the image data after pre-treatment in the memory device and reading out the pretreated data to be further processed by the second image processing circuit.

Nagasaki discloses storing frames of image data having undergone pre-treatment (e.g. amplification and A/D conversion) in a memory card (Figure 1, Item 34)

and performing data formatting and compression (c. 8, ll. 46-55; c. 10, ll. 14-26) during non-operating periods of the camera in order record high quality images while enabling the user to take many pictures at short intervals (c. 2, ll. 17-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the data format processing and compression of AAPA in view of Freeman during non-operating periods of the camera in order record high quality images while enabling the user to take many pictures at short intervals.

[claims 14-16]

In regard to claims 14-16, note that these claims contain all limitations of claims 11-13 with the inclusion of a storage medium having a program stored therein to store a method which performs the steps taken by the apparatus in claims 11-13. Official Notice is taken that it is well known in the art to implement methods in software to take advantage of general purpose hardware which does not need to be specifically designed for a single application and allows for easy upgrading. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a software version of the apparatus of claims 11-13 as claimed in claims 14-16.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J Henn whose telephone number is (571) 272-7310. The examiner can normally be reached on M-F 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R Garber can be reached on (571) 272-7308. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TJH
3/5/2005

WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600